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**REMARKS**

Claims 1-51 are pending in the present Application. Claims 26-39, and 45-49 have been cancelled, Claims 1, 3, 9, 12, 16, 21-23, 40, and 50 have been amended, and Claims 52-56 have been added, leaving Claims 1-25, 40-44, and 50-56 for consideration upon entry of the present Amendment.

Support for the Amendment to Claims 1 and 50 can at least be found in the specification at page 7, lines 11-20 and page 21 lines 9-20.

Claims 3 and 12 have been rewritten in independent form.

Claims 9, and 21-23 have been amended to correct typographical errors and informalities contained therein.

Support for new Claims 52-54 can at least be found in the specification at page 16, lines 11-19.

Support for new Claim 55 can at least be found in originally filed Claim 23.

Support for new Claim 56 can at least be found in originally filed Claims 8 and 49.

Further, with regards to Claims 1, 3, 12, and 40 the claims have been amended for clarity. Support for this amendment can at least be found in the specification at page 9, lines 3-7.

The Specification has been amended to correct certain typographical errors, as explained in detail below. No new matter has been introduced by these amendments. Reconsideration and allowance of the claims is respectfully requested in view of the above amendments and the following remarks.

**Election/Restrictions**

Applicants hereby confirm the provisional election made by Pamela Curbelo on April 26, 2004 to prosecute Group I, i.e., to prosecute Claims 1-25 and 40-51. Applicants hereby cancel Claims 26-39 without prejudice to Applicants' rights thereto, which includes Applicants' right to file a divisional application thereon.

**Specification**

In reviewing the specification, several typographical errors were noted. Applicants have amended the specification to correct those typographical errors. More particularly, Applicants

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have amended the reference numerals in the paragraph beginning at line 9 on page 1 and ending at line 6 on page 2 such that the written description corresponds to references numerals illustrated in Figure 1. Support for this amendment can at least be found in Figure 1.

Applicants have amended the paragraph on page 6, lines 3-12 of the specification to correct typographical errors contained therein. Support for this amendment can at least be found in Claim 50.

Applicants corrected the misspelling of "material" on page 16, line 11 of the specification.

Applicants respectfully request that the Examiner enter these amendments as they place the case in a better condition for allowance.

#### Claim Objections

Applicants have amended the claims as suggested by the Examiner to correct the typographical errors contained therein. Accordingly, Applicants respectfully request that the Examiner withdraw the objection.

#### Claim Rejections Under 35 U.S.C. § 102(b)

Claims 1, 2, 5-7, 11, 40, 41, 45, 48, and 50 stand rejected under 35 U.S.C. § 102(b), as allegedly anticipated by U.S. Patent No. 5,641,586 to Wilson (hereinafter "Wilson '586"). Applicants respectfully traverse this rejection.

To anticipate a claim, a reference must disclose each and every element of the claim. *Leivmar Marine v. Varient Inc.*, 3 U.S.P.Q.2d 1766 (Fed. Cir. 1987).

With regard to independent Claims 1 and 50, Wilson '586 fails to teach an electrochemical cell system comprising, *inter alia*, a porous flow field member in fluid communication with a first flow field, wherein the flow field member comprises a porous support having a graded hydrophobicity, a graded hydrophilicity, a combination of a graded hydrophobicity and graded porosity, or a combination of a graded hydrophilicity and graded porosity. Rather, Wilson '586 teaches a fuel cell comprising a porous flow field that may be formed from a hydrophilic material. (Abstract). Wilson '586 also teaches that a hydrophobic material (gas diffusion backings 26, 46) can be supported on the porous flow field. (Col. 3, lines

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26-40). Absent, however, is any teaching of the porous support having a graded hydrophobicity, a graded hydrophilicity, a combination of a graded hydrophobicity and graded porosity, or a combination of a graded hydrophilicity and graded porosity.

Since Wilson '586 at least fails to teach a porous support having a graded hydrophobicity, a graded hydrophilicity, a combination of a graded hydrophobicity and graded porosity, or a combination of a graded hydrophilicity and graded porosity, Wilson '586 fails to teach each and every element of Applicants' independent Claims 1 and 50. Accordingly, independent Claims 1 and 50 are not anticipated by and are therefore allowable over Wilson '586. Moreover, as dependent claims from an allowable independent claim, Claims 2, 5-7, and 11 are, by definition, also allowable.

With regard to independent Claim 40, the Examiner stated that "the member may also comprise a metal cloth or screen support, which may be sintered [cite omitted]". (O.A., page 4). Applicants respectfully disagree with the Examiner that Wilson '586 teaches a flow field member comprising a sintered metal cloth as claimed by Applicants.

Rather, Wilson '586 teaches the structure for their macroporous flow field is generally a resin bonded carbon paper. (Col. 5, lines 6-8). Wilson '586 also teaches that "[o]ther possible porous structures include carbon or metal foams, sintered particles, and woven or non-woven metal screens." (Col. 5, lines 10-12). Although Wilson '586 teaches sintered particles, Wilson '586 does not teach a sintered metal cloth. For at least this reason, Wilson '586 fail to teach each and every element of Applicants' independent Claim 40. As such, Applicants' independent Claim 40 is not anticipated by and is therefore allowable over Wilson '586. Moreover, as a dependent claim from an allowable independent claim, Claim 41 is by definition is also allowable.

With regard to Claims 45 and 48, the rejection is moot, as those claims have been cancelled.

Claims 1, 2, 5-7, 9, 10, 18, 19, 45-47, and 50 stand rejected under 35 U.S.C. § 102(b), as allegedly anticipated by U.S. Patent No. 5,952,119 to Wilson (hereinafter "Wilson '119"). Applicants respectfully traverse this rejection.

It is noted that Wilson '119 is directed to similar subject matter as Wilson '586.

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Accordingly, Applicants respectfully direct the Examiners attention to the above discussion with regard to Wilson '586.

In short, Wilson '119 fail to teach a porous support having a graded hydrophobicity, a graded hydrophilicity, a combination of a graded hydrophobicity and graded porosity, or a combination of a graded hydrophilicity and graded porosity. As such, Applicants' independent Claims 1 and 50 are not anticipated by and are therefore allowable over Wilson '119. Moreover, as dependent claims from an allowable independent claim, Claims 2, 5-7, 9, 10, 18, and 19 are, by definition also allowable.

With regard to Claims 45-47, the rejection is moot, as those claims have been cancelled.

Claims 1, 2, 5-7, 12, 15, 45-47, 49, and 50 stand rejected under 35 U.S.C. § 102(b), as allegedly anticipated by WO 97/13287 to Mussell et al. Applicants respectfully traverse this rejection.

Similar to Wilson '586 and Wilson '119, Mussell et al. fail to teach an electrochemical cell system comprising, *inter alia*, a porous flow field member in fluid communication with a first flow field opposite, wherein the flow field member comprises a porous support having a graded hydrophobicity, a graded hydrophilicity, a combination of a graded hydrophobicity and graded porosity, or a combination of a graded hydrophilicity and graded porosity. Rather, Mussell et al. teach an electrochemical fuel cell comprising a porous layer 16 of "an electrically conductive porous material having at least two portions with different mean pore sizes...." (Page 10, lines 33-35). However, Mussell et al. is silent to a porous support having a graded hydrophobicity, a graded hydrophilicity a combination of a graded hydrophobicity and graded porosity, or a combination of a graded hydrophilicity and graded porosity.

Since Mussell et al. at least fail to teach a porous support having a graded hydrophobicity, a graded hydrophilicity, a combination of a graded hydrophobicity and graded porosity, or a combination of a graded hydrophilicity and graded porosity, Mussell et al. fail to teach each and every element of Applicants' independent Claims 1 and 50. Accordingly, Applicants' independent Claims 1 and 50 are not anticipated by and are therefore allowable over Mussell et al. Moreover, as dependent claims from an allowable independent claim, Claims 2, 5-7, and 15 are, by definition, also allowable.

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With regard to Claim 12, it is first noted that claim has been rewritten in independent form. In making the rejection, the Examiner merely stated that the flow member of Mussell et al. comprises "two layers (18, 16), each having a different porosity...." (O.A., page 5). However, Mussell et al. is silent as to the hydrophobicity of each layer. For at least this reason, Mussell et al. fail to teach each and every element of independent Claim 12. As such, Applicants' independent Claim 12 is not anticipated by and is therefore allowable over Mussell et al.

With regard to Claims 45-47 and 49, the rejection is moot, as those claims have been cancelled.

Claim Rejections Under 35 U.S.C. § 103(a)

Claims 3, 4, 22-25 and 51 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over WO 97/13287 to Mussell et al. Applicants respectfully traverse this rejection.

For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a *prima facie* case of obviousness, i.e., that all elements of the invention are disclosed in the prior art; that the prior art relied upon, coupled with knowledge generally available in the art at the time of the invention, contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or combined references; and that the proposed modification of the prior art had a reasonable expectation of success, determined from the vantage point of the skilled artisan at the time the invention was made. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988); *In Re Wilson*, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970); *Amgen v. Chugai Pharmaceuticals Co.*, 927 U.S.P.Q.2d, 1016, 1023 (Fed. Cir. 1996).

With regard to Claims 3 and 4, it is first noted that Claim 3 has been rewritten in independent form. In making the rejection the Examiner stated

[T]he artisan would be sufficiently skilled to manipulate the amount of carbon and polymer in each layer so as to affect the electrical conductivity, hydrophilicity, and hydrophobicity of the resulting layer (see page 13, line 36). It has been held that the discovery of an optimum value of a result effective variable in a known process is ordinary within the skill of the art.... (O.A., page 7). Applicants respectfully disagree with the Examiner that the claimed ranges are obvious.

More particularly, Applicants respectfully submit that the amount of polymer employed in a porous support flow field member is a result-effective variable previously unrecognized by the prior art. Where the prior art has not recognized the "result-effective" capability of a

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particular invention parameter, no expectation would exist that optimizing the parameter would successfully yield the desired improvement. *In re Antonie*, 559 F.2d 618, 195 U.S.P.Q. 6 (C.C.P.A. 1977). Rather, Mussell et al. merely teach that “[i]t is believed that higher voltages at higher current density require the small pore region [of the intermediate layer of the porous material] to be more hydrophobic than at lower current densities”. (Page 13, line 37 to page 14, line 1). In other words, Mussell et al. fail to teach polymer concentration in a flow field member is a result effective variable. As such, there is no expectation of success that optimizing the polymer concentration would successfully yield a desired improvement in the electrical conductivity, hydrophilicity, and hydrophobicity as alleged by the Examiner. Accordingly, Applicants' independent Claim 3 is not obvious, and is therefore allowable over Mussell et al. Moreover, as a dependent claim from an allowable independent claim, Claim 4 is, by definition, also allowable.

With regard to Claims 22-25 and 51, it is noted that these claims are allowable for at least the reason that they depend from an allowable independent claim. More particularly, as discussed above, Mussell et al. fail to teach or suggest a porous support having a graded hydrophobicity, a graded hydrophilicity, a combination of a graded hydrophobicity and graded porosity, or a combination of a graded hydrophilicity and graded porosity. As such, independent Claims 1 and 50 are not obvious, and are therefore allowable over Mussell et al. As dependent claims from an allowable independent claim, Claims 22-25 and 51 are, by definition, also allowable.

Claims 8, 20, and 21 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Wilson '586. Applicants respectfully traverse this rejection.

As discussed above, Wilson '586 at least fail to teach or suggest a porous support having a graded hydrophobicity, a graded hydrophilicity, a combination of a graded hydrophobicity and graded porosity, or a combination of a graded hydrophilicity and graded porosity. As such, Wilson '586 fail to teach or suggest each and every element of Applicants' independent Claim 1. As such, Applicants' independent Claim 1 is not obvious over Wilson '586. Claims 8, 20, and 21 are allowable for at least the reason that they depend from an allowable independent claim.

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Claims 13, 14, 16, 17, and 40-43 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over WO 97/13287 to Mussell et al. in view of Wilson '586. Applicants respectfully traverse this rejection.

With regard to Claims 13, 14, 16, and 17, Applicants respectfully submit that these claims are allowable for at least the reason that they dependent from allowable independent Claim 12. More particularly, as noted above, Mussell et al. at least fail to teach or suggest a porous flow field member comprises a first layer comprising a first layer having a first hydrophobicity, and a second layer having a second, different hydrophobicity. While Mussell et al. teach a layered porous flow field structure, Mussell et al. are silent with regards to the hydrophobicity of each layer. Additionally, it is noted that Wilson '586 fail to cure the deficiencies of Mussell et al., as they too fail to teach a first layer having a first hydrophobicity, and a second layer having a second, different hydrophobicity. As such, independent Claim 12 is not obvious, and is therefore allowable over Mussell et al. in view of Wilson '586. Therefore, Claims 13, 14, 16, and 17 are allowable for at least the reason that they dependent from allowable independent Claim 12.

With regard to independent Claim 40, as noted by the Examiner, "WO '287 does not expressly teach that the porous supports comprise metal screens or sintered metal cloths, as recited in the instant claims." (O.A. page 8). Rather, the Examiner relied upon Wilson '586 to teach these elements. However, as noted above, Wilson '586 fails to teach or suggest all of the elements that the Examiner had relied upon it for teaching. More particularly, Wilson '586 teaches the structure for their macroporous flow field is generally a resin bonded carbon paper. (Col. 5, lines 6-8). Wilson '586 also teaches that "[o]ther possible porous structures include carbon or metal foams, sintered particles, and woven or non-woven metal screens." (Col. 5, lines 10-12). Although Wilson '586 teaches sintered particles, Wilson '586 does not teach or suggest a sintered metal cloth. For at least this reason, the above-cited references, either alone or in combination, fail to teach or suggest each and every element of Applicants' independent Claim 40. As such, Applicants' independent Claim 40 is not obvious, and is therefore allowable over the above-cited references. Moreover, as a dependent claims from an allowable independent claim, Claim 41-43 are, by definition, also allowable.

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Claims 44 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over WO 97/13287 to Mussell et al. in view of Wilson '586. Applicants respectfully traverse this rejection.

As noted above, Applicants independent Claim 40 is not obvious, and is therefore allowable over Mussell et al. in view of Wilson '586. As a dependent claim from an allowable independent claim, Claim 44 is, by definition, also allowable.

Prior Art Made of Record

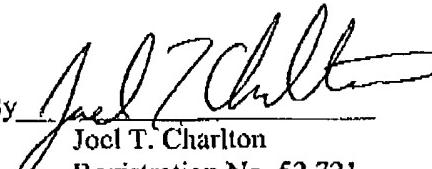
Applicants respectfully submit that the pending claims are not anticipated by and are not obvious over any of the prior art made of record.

It is believed that the foregoing amendments and remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and allowance is requested.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 06-1130.

Respectfully submitted,

CANTOR COLBURN LLP

By   
Joel T. Charlton  
Registration No. 52,721

Date: July 12, 2004  
CANTOR COLBURN LLP  
55 Griffin Road South  
Bloomfield, CT 06002  
Telephone (860) 286-2929  
Facsimile (860) 286-0115  
Customer No.: 23462